

Adult Learners' Perspectives about Microlearning: Implications on the Design of Bite-Sized Content

Hyo-Jeong SO^a, Seak-Zoon ROH^b, Jeong-Eun OH^b, Hyeran LEE^a, Jihyang LEE^a, Seohyeon JI^c

^a*Department of Educational Technology, Ewha Womans University, Korea*

^b*Department of Education, Sungshin Women's University Korea*

^c*Department of Education, Chungbuk National University, Korea*

* hyojeongso@ewha.ac.kr

Abstract: The purpose of this research is to draw implications and insights for the design of microlearning. This study investigated two questions concerning (a) what kinds of topics and knowledge are relevant to learn through bite-sized content and (b) how to design bite-sized content effective for supporting adult learners' microlearning opportunities. We conducted a research study with adult learners who are mostly graduate-level students and R&D professionals working in the fields of science and technology in Korea. To examine their experiences and perspectives about microlearning, we gathered data through the survey and focus group interviews. Overall, this study found that adult learners tend to have some separations about the topical areas perceived to be relevant for e-learning and microlearning. The design of bite-sized content that takes the modality of video and can be consumed within 3-5 minutes was considered to be the most relevant for microlearning. In conclusion, we discuss the implications concerning the potential and challenges in designing microlearning.

Keywords: Adult learners, lifelong learning, microlearning, bite-sized content

1. Introduction

Education is no longer locked in a formal setting and is changing by constant communication with learners. While the existing education paradigm emphasizes the efficiency of knowledge delivery and transfer, education in the information age necessitates the fundamental change in how learners construct their own knowledge and develop core competencies as 21st century learners (Collins & Haverson, 2018). Subsequently, these changes in the educational paradigm require the design of learning environments that support adult learners for lifelong and lifewide learning opportunities. This means the growing criticality of 'informal learning' spaces where learning happens mostly in self-directed ways beyond the conventional structured learning methods. In such informal learning spaces, adult learners enter and participate in a learning environment voluntarily, mainly motivated by their interests and needs.

Concomitantly, the proliferation of smart devices and the advancement of web environments have affected how people learn and interact. The *Horizon Report*, published by the New Media Consortium (NMC) in 2017, emphasized blended learning as one of the major trends of higher education (Johnson, Becker, Estrada, & Freeman, 2017). Brown and Adler (2008) also argue that longtail learning emerges with almost unlimited choices of online learning content. Another noteworthy trend in recent years is the rise of bite-sized content and media for learning. Bite-sized or micro-content is designed to deliver information in the form of short video clips (e.g., TED, Instructables), infographics and card news. The proliferation of bite-sized content services is closely related to the social phenomenon in which the kind and amount of knowledge that an individual has to acquire is rapidly increasing. From the user's point of view, bite-sized content easily accessible via computers and mobile devices is advantageous for the on-the-go consumption, minimizing temporal and spatial constraints.

Microlearning is the term that represents the use of bite-sized content for learning and generally refers to a small topic-based content that can be learned in a short timeframe (Hug, 2005). Microlearning can be offered across Web 2.0 technologies and social media as well as traditional learning management systems (Grevtseva, Willems, & Adachi, 2017). Despite such growing interests toward microlearning, little has been known about how to design bite-sized content relevant and effective for adult learners. Our review of the existing literature on microlearning indicates that little academic research studies have been conducted in this area (So & Lee, 2017). We conducted a systematic literature review on the topic of microlearning published in the years from 2003 to 2017 and identified 74 articles. Only 13 articles reported empirical findings, and the existing articles on microlearning are mostly about theoretical/conceptual discussions and technical development. This implies the need for more empirical research that unpacks the mechanism of microlearning.

With this backdrop, this study was initiated with the assumption that bite-sized content is not simply truncated tiny information but is a stand-alone manageable content that carries meaningful information and knowledge on its own. Another assumption behind this study was that not all types of knowledge may be relevant for microlearning, and there are certain types of knowledge that can be better designed and delivered as bite-sized content. To this end, we conducted a research study with adult learners who had prior experiences with microlearning. What kinds of topics and knowledge are relevant for them to learn through bite-sized content? How do we design bite-sized content effective for supporting adult learners' microlearning opportunities? These are the questions that this study aimed to answer, ultimately drawing implications and insights for the design of microlearning.

2. Method

2.1 Research Context

In this study, the concept of microlearning is defined as learning with bite-sized content that can be consumed by learners in informal or non-formal learning spaces, and convey knowledge or information in a concise form through various types of modality such as video, document, infographic and audio. For this study, the research team collaborated with the government-affiliated organization that is the main provider of online learning courses for enhancing the knowledge base and capacity of the science and technology workforce in Korea. The participants of this study were adult learners who had taken courses provided by this organization. Some courses (e.g., research ethics, lab safety) provided by this organization are mandatory for graduate-level students and R&D professional working in the fields of science and technology in the government-affiliated R&D institutes. While these learners are considered to possess relatively high levels of expert knowledge in their areas, there have also been increasing demands to support this R& D workforce to continuously update and improve their knowledge and skills, as a response to the rapidly changing nature of knowledge in the science and technology fields. To examine their experiences and perspectives about microlearning, we gathered data through the survey and focus group interviews.

2.2 Survey

We designed the online survey that includes questions about the prior experiences with microlearning (e.g., What was the best thing about using microlearning?), the modality of microlearning content (e.g., What is the most ideal length of microlearning content?), the types of areas and topics that they are interested in learning through microlearning (e.g., Which of the following R&D topics do you think is important?). We distributed the online survey to learners who had already completed e-learning courses provided by the collaborating organization. A total of 791 people completed the online survey. The collected data was analyzed by descriptive statistics to identify overall patterns and ranked orders.

2.3 Focus Group Interview

The purpose of focus group interview (FGI) was to better understand adult learners’ characteristics and needs related to the design of microlearning content and environment, mainly from the content consumer’s perspectives. We selected 13 participants (9 males and 4 females) who completed two or more e-learning courses provided by the collaborating organization. The FGI was conducted in two separate sessions at a meeting room, facilitated by the research team. The FGI was conducted for two hours with semi-structured questions that focus on the needs for microlearning and relevant topics of knowledge for bite-sized content. The collected data was analyzed using the content-analysis method to identify overall patterns and trends of responses.

3. Results

3.1 Survey

Among the 755 respondents who submitted valid responses, 326 (43.2%) answered that they had prior experiences with microlearning. First, we asked the question about the modality of bite-sized content, both media type and ideal length. Video (64%) was perceived to be the most useful modality of content for microlearning, followed by 21.5 % in visual images (e.g., cartoons, infographics), and 13.5% in text (e.g., reports, news articles). Concerning the ideal length of bite-sized content for microlearning, as shown in Figure 1, the participants felt that the content length between 3-5 minutes is the most ideal for microlearning, followed by 7-10 minutes (28.2%) and 5-7 minutes (16.6%). The data also indicates that the participants were less favorable about the content being extremely short (less than 3 mins.) or more than 10 minutes.

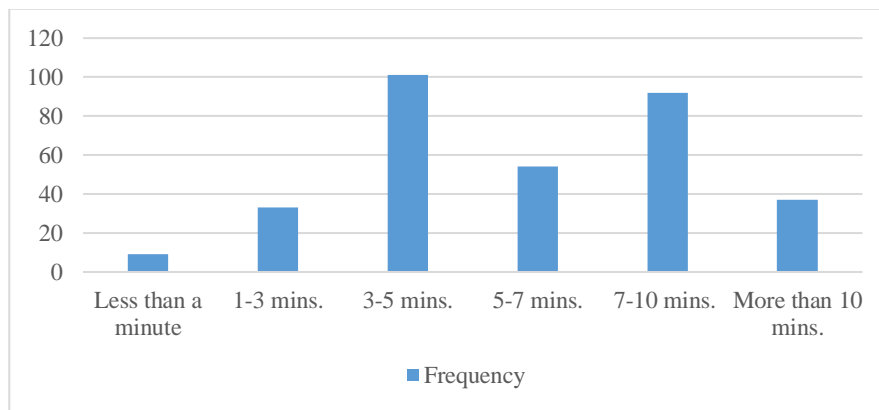


Figure 1. Ideal Length of Bite-sized Content (N=326)

Second, we analyzed more specifically what types of R&D topics the participants perceived the most relevant for microlearning. In this question, duplicated responses were allowed. Table 1 summarizes the top five-ranked topics. Overall, the data indicates that the participants perceived the needs for microlearning in the topic areas that deal with the latest issues and are beneficial for their creative ideas. The needs for domain-specific topics that deal with deeper knowledge levels were perceived to be less important or relevant for microlearning.

Table 1

Rank-order of Microlearning

Rank	Topic	Percentage
1	Latest issues in science	42.0%
2	Practical interpretation skill	38.7%
3	Cases of creative development	37.1%

4	R & D planning	24.6%
5	Creating ideas	23.8%

Lastly, we examined what properties of microlearning are perceived to be the most beneficial from the consumer's perspectives. As shown in Table 2, the participants rated 'efficiency' as the most beneficial property, followed by practicality, diversity, on-demand, and interest-based content. This finding may indicate that from the content consumers' perspectives, microlearning is attractive mainly for its efficiency in accessing content, coupled with the practical and diverse content supporting the on-demand content consumption.

Table 2

Rank-order of Microlearning Properties

Rank	Property of microlearning	Percentage
1	Efficiency	32.0%
2	Practicality	14.6%
3	Diversity	13.6%
4	On-demand	10.7%
5	Interest-based	8.7%

3.2 Focus Group Interview

3.2.1 Demand for the Currentness in Bite-sized Content

We opened the focus group interview with a discussion on what constitutes the definition of microlearning from the participants' perspectives. It was to form a common ground on the definition among the participants for future discussions. It was rather surprising to find that the participants were less familiar with the term 'microlearning' and had difficulty differentiating microlearning with other forms of e-learning. Most participants indicated that microlearning refers to the content that is presented in the form of brief information and knowledge.

Throughout the FGI session, it becomes clear that the demand for microlearning that deals with the latest issues and current trends in the R&D fields is high. The participants indicated the need of the hub where they could easily access the latest articles, research issues and trends in the science and technology field. Another highly-demanded area was more information- or idea-oriented such as the question & answer section to share cross-field ideas and statistical data. Overall, the 'currentness' of information and knowledge characterizes the highly demanded areas of topics for microlearning. It was worthy to note that the participants equally pointed out the dilemma that may arise with the currentness of microlearning content. They raised the questions about the efficiency of developing bite-sized content that needs frequent content updating, which will increase the cost of production.

3.2.2 Coupling Microlearning and e-learning Content

The FGI participants reached the consensus on the need to integrate microlearning and e-learning. Behind this idea was the separation of content areas relevant for microlearning content (e.g., 3-5 mins. video clip) and e-learning (e.g., longer timeframe, a series of modularized content). The participants perceived that microlearning is better suited to deliver the key concepts and knowledge of the science and technology R&D field, whereas e-learning is more effective to deliver advanced deeper levels of knowledge. Certain topics like research ethics and laboratory safety are essential for most professionals working in the science and technology R&D field. The

participants indicated that such common topics require the acceptable level of knowledge mastery, which can be better learned in lecture formats via e-learning. As shown as a T-shaped structure in Figure 2, they also suggested that domain-specific information that is changing rather frequently (e.g., regulations, laws) can be learned by e-learning, coupled with the provision of bite-sized content in domain-general areas such as communication, leadership and humanity topics.

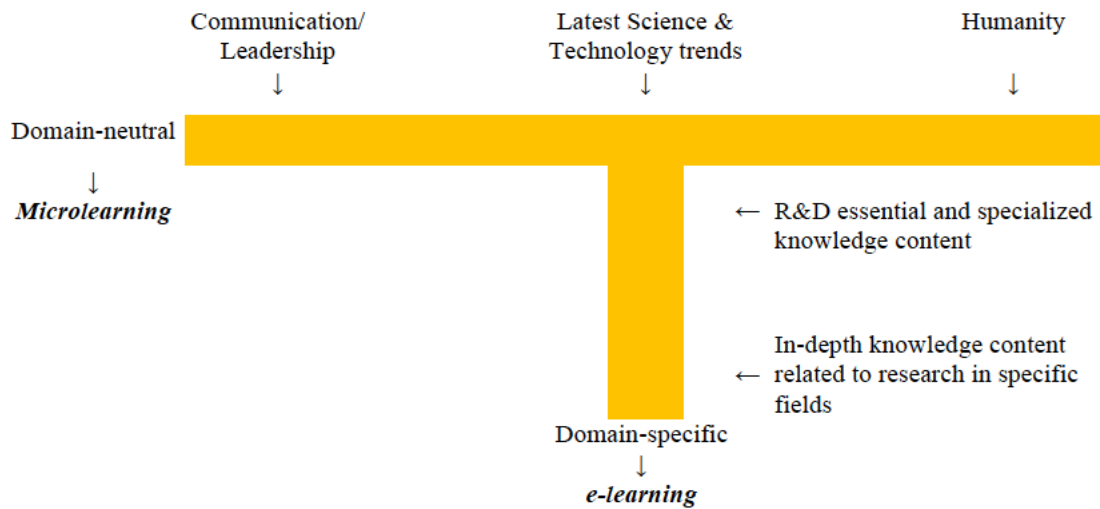


Figure 2. Microlearning and e-learning for Domain-neutral and Domain-specific Topics

4. Discussion and Conclusion

Through the survey and FGI method, we examined the perceptions that adult learners in the science and technology R&D fields have about microlearning. One of the key findings of this research is that there were some separations about the topical areas perceived to be relevant for e-learning and microlearning. While there is no unifying definition of microlearning, from adult learners' perspectives, the *timeframe* and *currentness* appear to be the most critical properties of bite-sized content that characterize microlearning. That is, the participants regarded something to be microlearning when it deals with the updated information in the amount of content that can be consumed within 3-10 minutes of timeframe. This finding implies the need to develop new frameworks and guidelines suitable to the core properties of microlearning content. For instance, we suggest the dual structure of the content development (Figure 3) where relatively stabilized content is delivered via the traditional e-learning method whereas topical and dynamic content is designed as bite-sized content for microlearning to support the on-demand and on-the-go consumption, easily accessible by mobile devices.

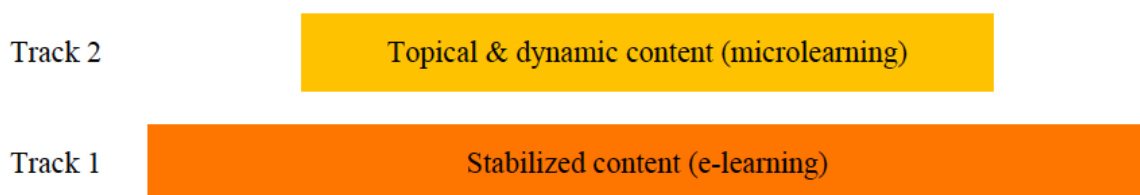


Figure 3. Dual Structure for the Content development

Another key finding from this study is the lack of consensus on what constitutes microlearning, indicating the semantic and epistemological differences and the need for redefining microlearning from the content consumers' perspectives. Whether bite-sized content designed for microlearning delivers merely information rather than knowledge is a debatable issue. Consequently, how to help

learners transcend from the information consumption stage to the knowledge building stage is an important area for future research. The current study also carries an important implication for the changing paradigm of content design and development. The rise of microlearning challenges the traditional linear model of instructional design and content development. As the nature of content delivered via microlearning tends to be dynamic, topical and interest-driven, the structure for developing content needs to be congruent with this trend. That is, it is essential to develop a mechanism for rapidly generating and disseminating bite-sized content. Hence, the current divide between content consumers and content providers may not be a viable model. A new convergent model where the content consumer also generates and disseminates bite-sized content may be a more sustainable model for microlearning, as already witnessed in the rise of user-generated video content.

Some limitations of the current study should be noted. Since this study focused on the adult learners who tend to be highly educated and are working in the professional fields, the findings may not be generalizable to other groups of adult learners with different backgrounds. Another limitation is the lack of statistical comparison. While it would be useful to further analyze the survey responses through meaningful group comparisons, we were unable to conduct inferential statistical analyses due to the anonymized survey and the lack of demographic data reported. Despite these limitations, we believe that this study provides important implications to the microlearning research areas and the directions for future research and development.

Acknowledgement

This research was supported by the Korea Institute of Human Resources Development in Science & Technology (KIRD). We would like to thank all the participants who helped this research project.

References

- Brown, J., & Adler, R. P. (2008). Open education, the long tail, and learning 2.0. *Educause Review*, 43(1), 16–20.
- Collins, A., & Halverson, R. (2018). *Rethinking education in the age of technology: The digital revolution and schooling in America*. New York, NY: Teachers College Press.
- Grevtseva, Y., Willems, J., & Adachi, C. (2017). Social media as a tool for microlearning in the context of higher education. In *European Conference on Social Media* (pp. 131–139). Academic Conferences and Publishing International.
- Hug T. (2005). Microlearning: A new pedagogical challenge. In T. Hug, M. Lindner, & P. A. Bruck (Eds.), *Micro learning: Emerging concepts, practices and technologies after e-learning* (pp. 7–12).
- Johnson, L., Becker, S. A., Estrada, V., & Freeman, A. (2017). *NMC Horizon Report: 2017 Higher Education Edition*. Austin, Texas: The New Media Consortium.
- Leam, J. (2012). Future direction for designing and developing digital textbooks based on a perspective of holistic education. *Journal of Holistic Convergence Education*, 16(1), 125–150.
- Lee, D. W., Ahn, J. H., Huh, S. Y., Lim, D. M., Gong, S. K., Jang, E. J., Lim, K. H. (2016). Smart learning to improve job skills in engineering. *Korea Information Processing Society review*, 23(1), 7–15.
- Lim, B., Leem, J., & Sung, E. (2013). What is the concept of smart education and the typology of smart education contents?. *Journal of Educational Technology*, 29(3), 459–489.
- So, H. J. & Lee, H. (2017). Analysis and implications of the research trend on microlearning. *Korea Science & Art Forum*, 30, 189–201.